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GAUTENG PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
NOVEMBER 2017
GRADE 9**

MATHEMATICS

NAME OF LEARNER: _____

GRADE: _____

TIME: 2 hours

MARKS: 100

18 pages + 1 formula sheet

P.T.O.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 8 questions and 19 pages, including the attached FORMULA SHEET.
2. Answer ALL questions.
3. A non-programmable calculator may be used unless otherwise stated.
4. Clearly show all calculations, diagrams and graphs that you have used in determining your answers. Answers only will not necessarily be awarded full marks.
5. If necessary, round-off answers to 2 decimal places, unless otherwise stated.
6. Diagrams are not necessarily drawn to scale. Reasons **MUST** always be given when doing geometry calculations.
7. Number your answers correctly according to the numbering system used in this question paper.
8. Answer Questions 2 to 8 in the spaces provided.
9. Write neatly and legibly.

P.T.O.

QUESTION 1

[10]

Answer the following questions by choosing the correct answer. Circle the LETTER of the correct answer.

- 1.1 Perpendicular lines are two straight lines that form a _____ angle when they meet or intersect each other.

A 180°
 B 360°
 C 90°
 D 45°

(1)

1.2. $\frac{(ab^2c)^3(2a^2)^2}{2a^5(b^3c^2)^2}$

A $\frac{2a^2}{2}$
 B $\frac{4ab}{c^2}$
 C $\frac{2ab}{c^2}$
 D $\frac{2a^2}{c}$

(1)

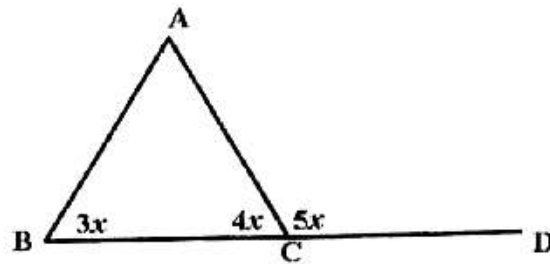
- 1.3. The next term in the pattern 7; 1; -5; -11 will be:

A 17
 B -17
 C -22
 D 16

(1)

P.T.O.

- 1.4 In $\triangle ABC$, BC is produced to D. The size of A in terms of x is...



- A $2x$
 B $12x$
 C $7x$
 D $9x$ (1)

- 1.5 Which of the following numbers is irrational?

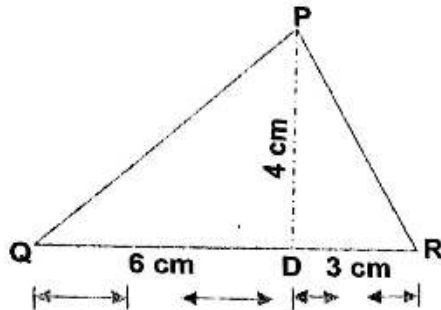
- A 0, 2
 B $0, \dot{5}$
 C $\sqrt{5}$
 D $\sqrt{6\frac{1}{4}}$ (1)

- 1.6 A circle has a diameter of 6 cm. The area of a quarter circle is ___ cm^2 .

- A 36π
 B 9π
 C $\frac{9}{4}\pi$
 D $\frac{9}{2}\pi$ (1)

P.T.O.

- 1.7 The perimeter of the following figure in cm is:



- A 20 cm
B 21,21 cm
C 9 cm
D 5 cm

(1)

- 1.8 Bonga covers a distance of 3,375 km in 45 minutes. The speed she travels at will be:

- A 60 km/h
B 4,5 km/h
C 120 km/h
D 2,53 km/h

(1)

- 1.9 The straight line graph defined by $y = 2x - 4$ will cut the y-axis at:

- A (0;4)
B (-4;2)
C (0;-4)
D (2; -4)

(1)

P.T.O.

1.10 In a bag there are 8 red balls, 6 blue balls, 2 white balls and 4 green balls. The percentage probability of drawing a red ball is:

- A 80%
- B 60%
- C 40%
- D 20%

(1)

QUESTION 2

[20]

2.1 Simplify the following:

2.1.1 $\frac{1}{2}(a + b) - 4a\left(\frac{1}{4}\right) - b$

(3)

2.1.2 $\frac{4}{x-5} + \frac{3}{x-2}$

(3)

2.1.3 $\frac{x^2+x-2}{x-1} \div \frac{x^2+2x}{4}$

(4)

P.T.O.

2.2 Factorise fully:

2.2.1 $24xy - 16x^2y + 8xy^2$

(2)

2.2.2 $x^2(x - 3) - 4(x - 3)$

(3)

2.3 Solve for x:

2.3.1 $4(x + 2) = 16 + 2(x - 1)$

(3)

2.3.2 $3^x = \frac{1}{27}$

(2)

P.T.O.

QUESTION 3**[13]**

- 3.1 Sihle wants to buy a bicycle that costs R799,00. He cannot afford to pay the full amount all at once, so the seller allows him to pay R79,90 now as a deposit and pay the rest over 3 years at 20% p.a.

- 3.1.1 Calculate the amount that he still needs to pay, after he has paid the deposit.

(1)

- 3.1.2 What interest amount does he need to pay on the remainder?

(3)

- 3.1.3 What is the total amount that Sihle still has to pay?

(2)

- 3.1.4 How much must he pay every month for the bike for the next 3 years?

(2)

- 3.1.5 How much would have been paid altogether for the bicycle at the end of 3 years?

(2)**P.T.O.**

3.2 Biltong is sold at R21,50 per kilogram. Complete the table below:

Amount of biltong	Amount paid	Change in rands
2 kg	R50,00	R7,00
A	R40,00	R18,50
500 g	B	R4,25
3,5 kg	R200,00	C

A _____

B _____

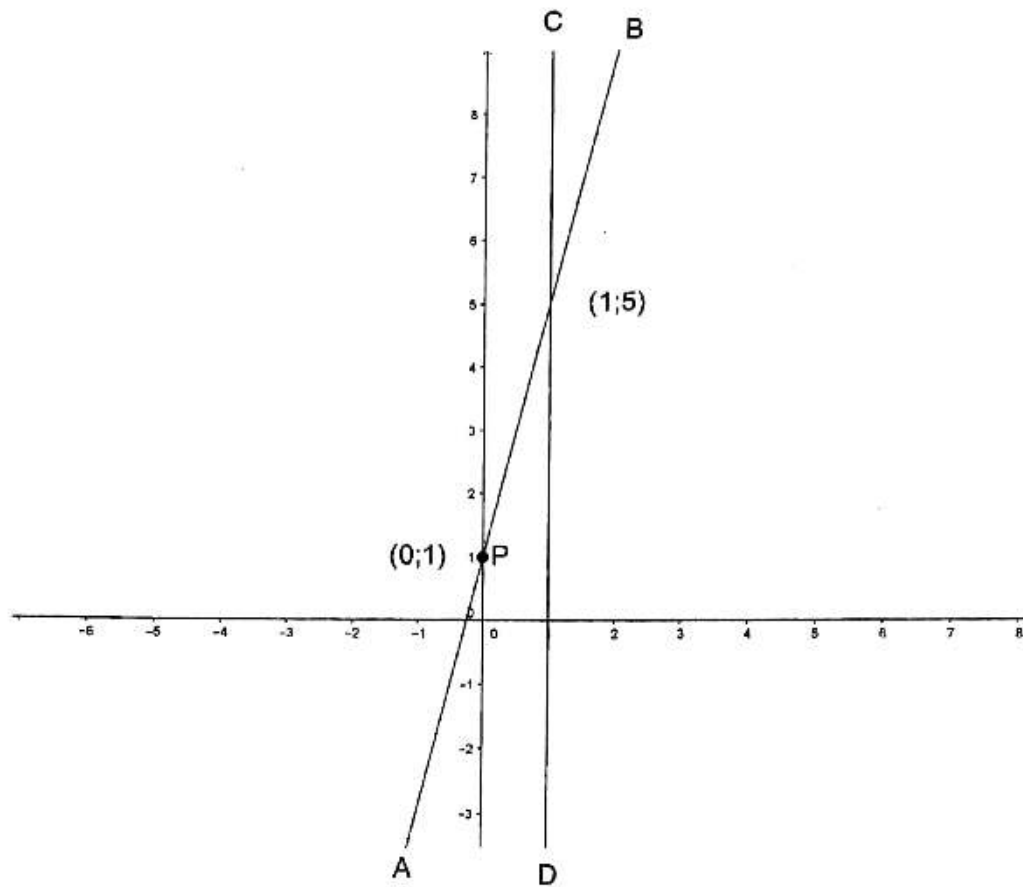
C _____ (3)

P.T.O.

QUESTION 4

[4]

4.1 Study the following graphs and answer the questions that follow.



4.1.1 Calculate the gradient of line AB, you may use the given formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

(2)

4.1.2 Find the equation of line AB in the form: $y = mx + c$.

(2)

P.T.O.

QUESTION 5

[10]

5.1 Study the diagram pattern below. Complete the table for figures 4 and 5.

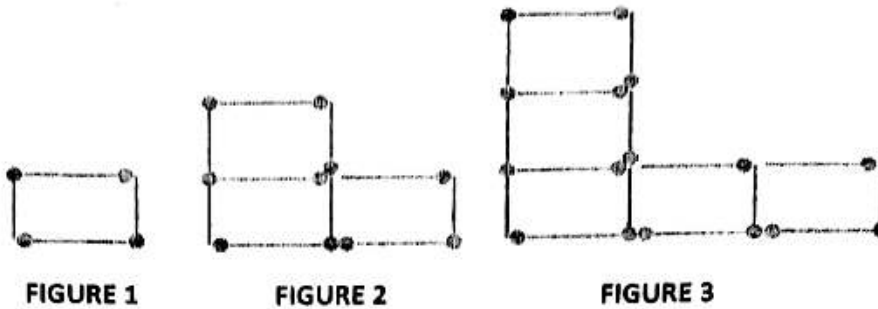


FIGURE	1	2	3	4	5
NUMBER OF MATCHSTICKS	4	10	16		

(2)

5.2 Describe the pattern in your own words.

(1)

5.3 Determine the rule of the pattern in terms of T_n .

(2)

5.4 Determine the 10th term.

(2)

5.5 Which term of the sequence is equal to 76?

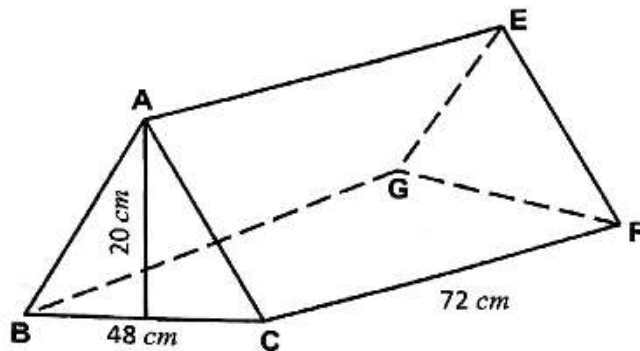
(3)

P.T.O.

QUESTION 6

[8]

In the triangular prism below, $AB = AC = 25\text{ cm}$ and $AD \perp BC$



Calculate:

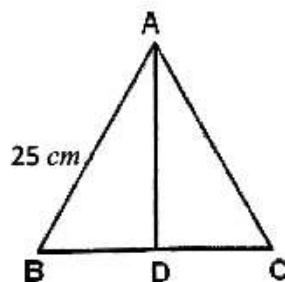
6.1 Volume of the prism

(2)

6.2 Surface Area of the prism

(3)

6.3 In the triangle below, $BC = 48\text{ cm}$ and $BD = DC$. Show that $AD = 7\text{ cm}$.

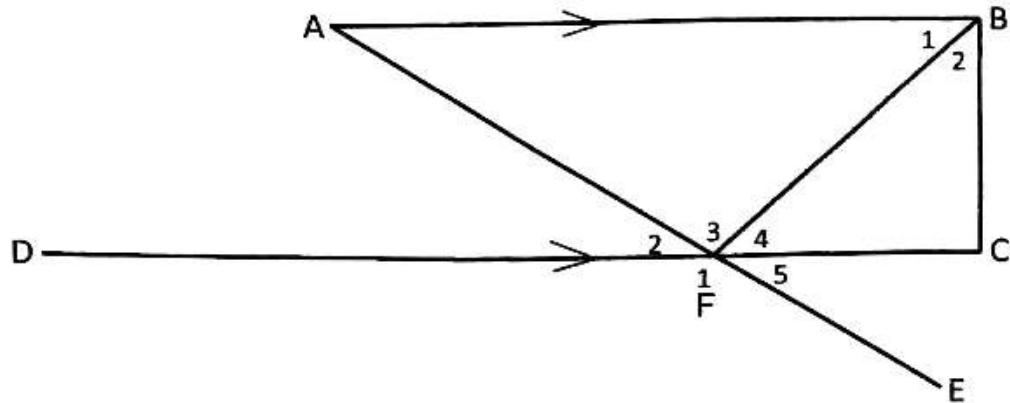


(3)

P.T.O.

QUESTION 7

[24]

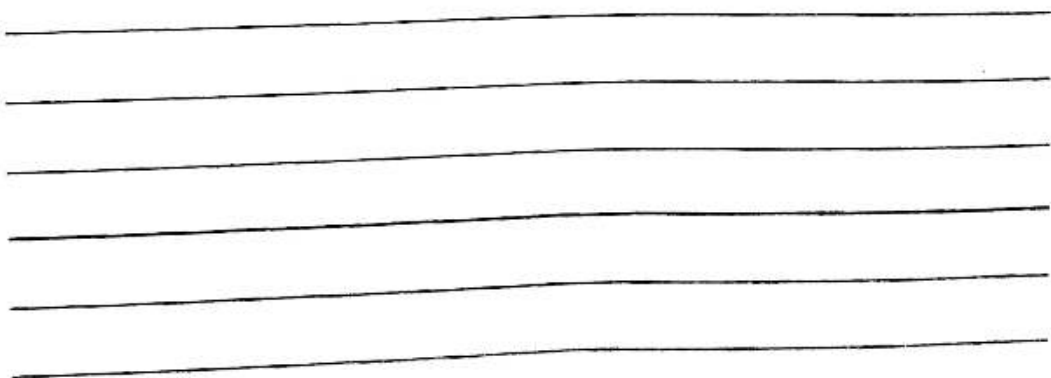
7.1 Given: $AB \parallel CD$ 

Complete the statement and give suitable reasons.

Statement	Reasons
7.1.1 $\hat{F}_2 = \hat{F}_5$	
7.1.2 $\hat{B}_1 =$ _____	Alternate angles
7.1.3 $\hat{C} + \hat{ABC} =$ _____ $^\circ$	
7.1.4 If $\hat{B}_2 = \hat{F}_4$ then $BC =$ _____	

(5)

7.2 Using a pencil, ruler and a pair of compasses construct $\triangle EFG$ with $FG = 6,5$ cm, $EG = 6$ cm and $EF = 3$ cm.

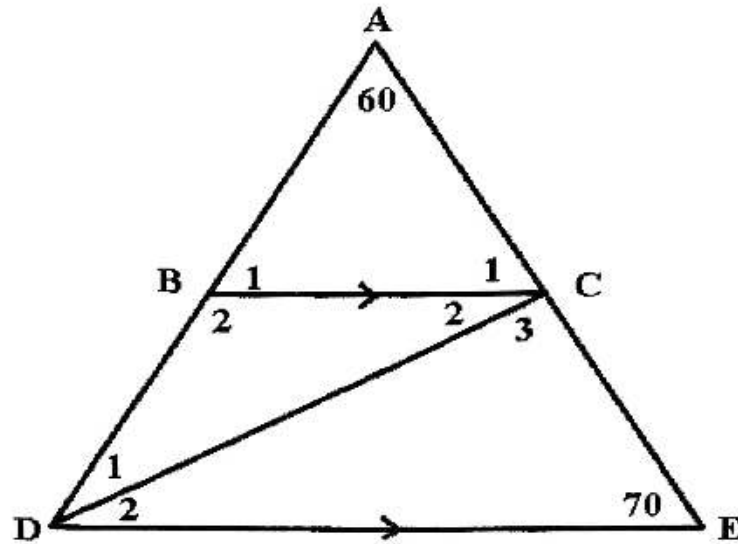


(4)

P.T.O.

7.3 Study the following diagram and then answer the questions that follow.

$BC \parallel DE$ and $\hat{D}_1 = \hat{D}_2$. Determine the size of the following angles with reasons.



7.3.1 $\hat{D}_2$

Statement	Reason

(2)

7.3.2 $\hat{C}_1$, $\hat{C}_2$ and $\hat{C}_3$.

Statement	Reason

(6)

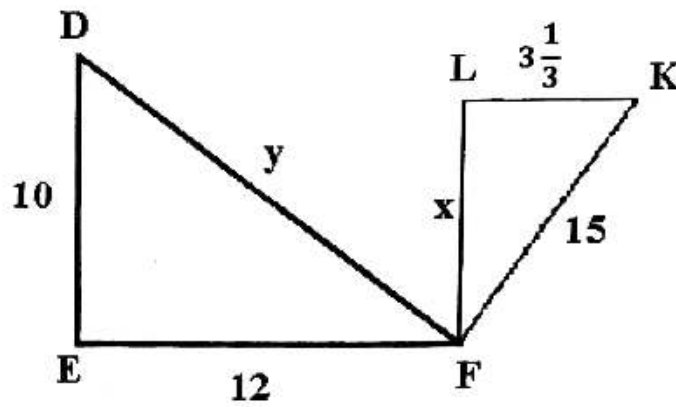
7.3.3 $\hat{B}_1$ and $\hat{B}_2$.

Statement	Reason

(4)

P.T.O.

- 7.4 In the diagram below $\triangle DEF \sim \triangle KLF$. Determine the values of x and y . Round off your answer to the nearest whole numbers.



Statement	Reason

(3)

P.T.O.

QUESTION 8

[11]

Given below are the heights in cm of 12 learners at a school.

142	163	169	132
161	132	162	172
141	170	156	155

8.1 Arrange the heights in ascending order.

 _____ (1)

8.2 Determine the following:

8.2.1 The average height of the 12 learners

 _____ (2)

8.2.2 The median

 _____ (2)

8.2.3 The mode

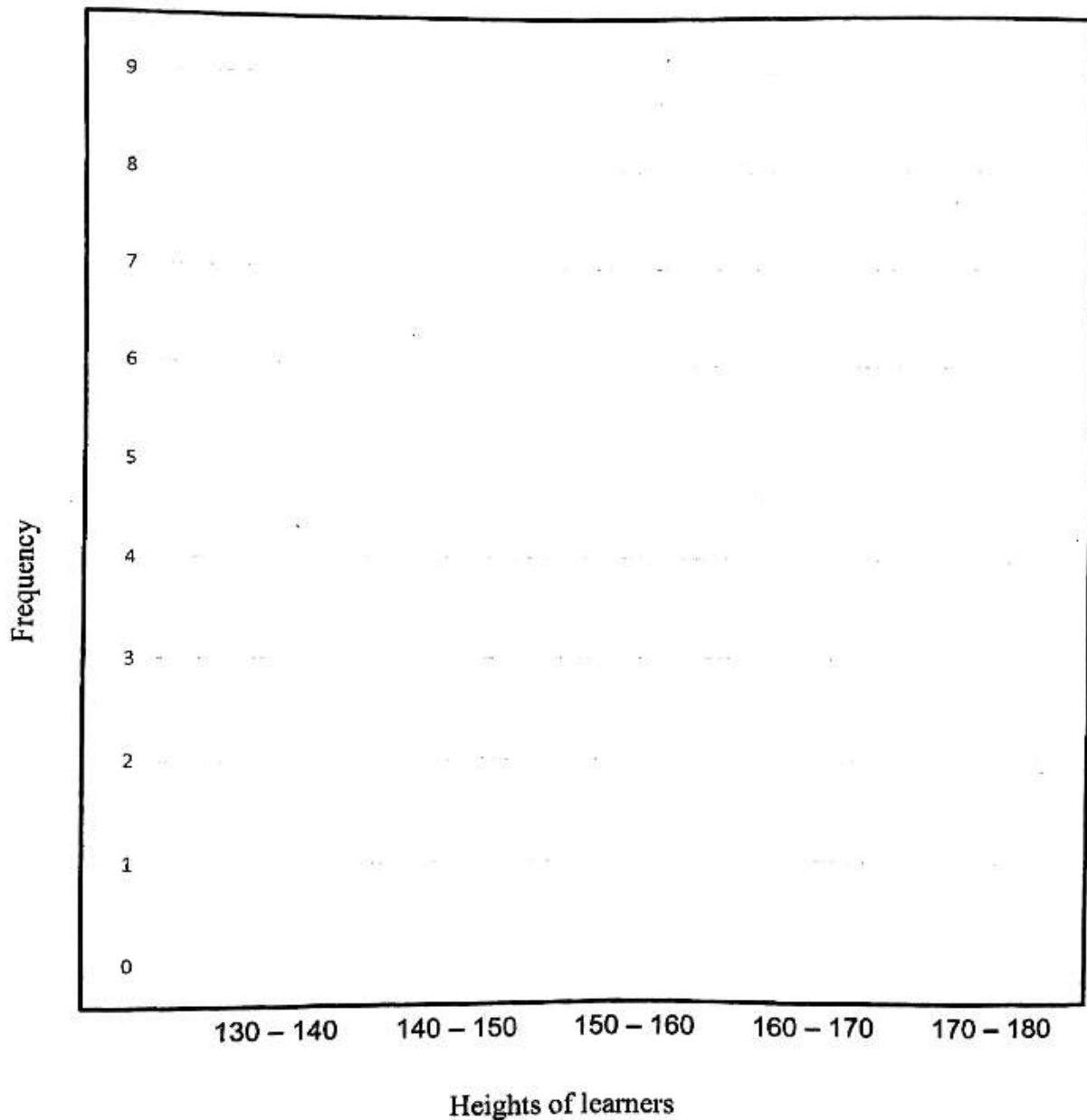
 _____ (1)

P.T.O.

8.3 Use the following table to draw a bar graph.

(3)

Height in cm	Frequency
$130 \leq h < 140$	7
$140 \leq h < 150$	5
$150 \leq h < 160$	7
$160 \leq h < 170$	9
$170 \leq h < 180$	2



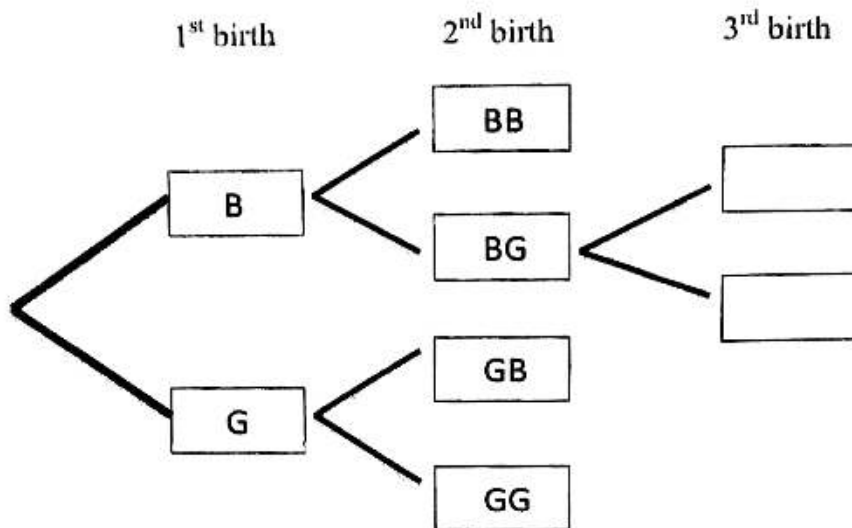
P.T.O.

8.4

The tree diagram below shows the possible outcome of a child's birth up to the third birth.

B represents a boy child and G represents a girl child. Complete the missing outcome in the third birth.

(2)

**TOTAL: 100****END**

FORMULA SHEET

Simple Interest:

$$I = \frac{Prn}{100}$$

$$A = P(1 + in)$$

$$A = P\left(1 + \frac{rn}{100}\right)$$

Compound Interest:

$$A = P(1 + i)^n$$

$$A = P\left(1 + \frac{r}{100}\right)^n$$

	Perimeter	Area
Rectangle	$2(l + b)$	$l \times b$
Circle	$2\pi r$	πr^2
Triangle	$(s_1 + s_2 + s_3)$	$\frac{1}{2}b \times h$